Plant nutrition – 2022 November O Level 5090

1. Nov/2022/Paper_11/No.7

A small mountain lake has aquatic plants growing under water on the lake bed. Shortly after heavy rainfall, the mud on the lake bed becomes stirred up and the water level rises.

Why does this cause the rate of photosynthesis of these plants to fall?

A extra carbon dioxide

B extra dissolved nitrates

C lower light intensity

D lower oxygen concentration

2. Nov/2022/Paper_11/No.8

Some plants have large leaves and are growing well but the leaves are turning yellow.

Which factor is likely to be causing this problem?

A a lack of magnesium in the soil

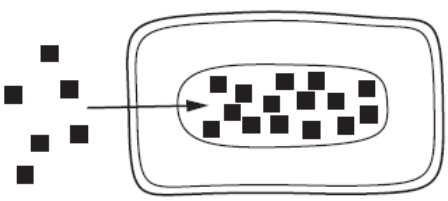
B a lack of water in the soil

C not enough sunlight

D too much nitrate in the soil

3. Nov/2022/Paper_12/No.4

Which process is moving nitrate ions into the cell shown?



A active transport

B diffusion

C osmosis

D translocation

4. Nov/2022/Paper_12/No.7

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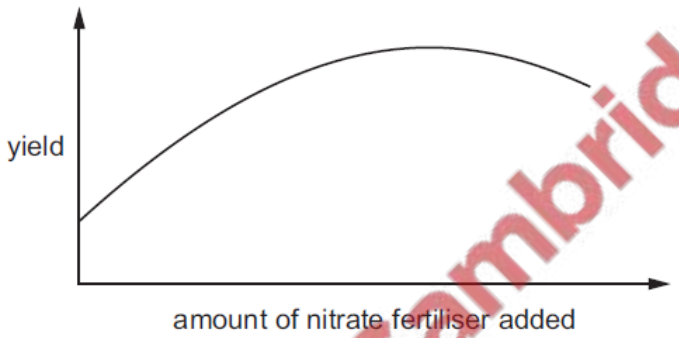
5. Nov/2022/Paper_12/No.8

The graph shows how the yield of a wheat crop varies with the addition of different amounts of nitrate fertiliser.



What can be concluded from the graph?

A Nitrates help the formation of chlorophyll in wheat leaves.

B The yield of wheat is proportional to the amount of nitrate fertiliser added.

C Nitrate is needed for the formation of proteins.

D Nitrates are required for healthy plants, but excess nitrates may inhibit growth.

6. Nov/2022/Paper_12/No.13

The table shows weather conditions in a field.

Which row shows conditions that would cause a plant to wilt most rapidly?

	air temperature / °C	humidity	time of day	wind speed / km per hour
A	15	raining	00:00	32
B	12	dry	14:00	24
C	6	fog / rain	08:00	3
D	5	dry	22:00	16

7. Nov/2022/Paper_21/No.2(a)

Grapes are fruits that grow on a plant called a grape vine.
A farmer grows a variety of grape vine called the sultana.
The grapes produced are sold to be eaten fresh or used to make dried fruit called sultanas.

grape vine

bunch of grapes

(a) 100 g of fresh grapes produced by the vine contains 15.5 g of sugars.
Describe and explain how the plant produces sugars and transports sugars to the fruit.

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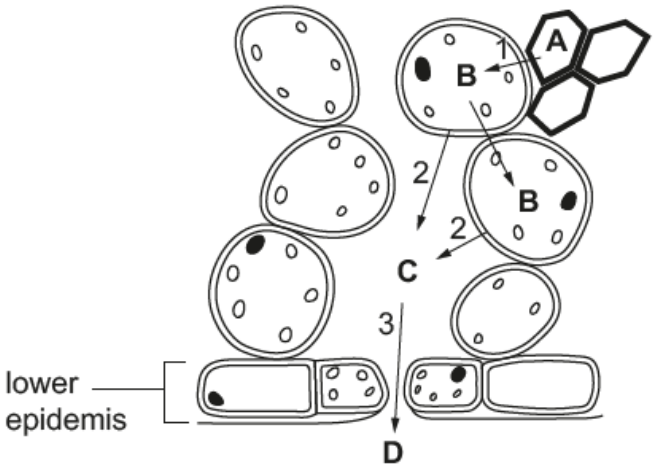
8. Nov/2022/Paper_21/No.6(a, b)

The diagram shows some cells from the lower part of a transpiring leaf.



(a) (i) Identify cell type **B**.

B ..... [1]

(ii) Water travels from **A** to **D**. The arrows on the diagram represent the movement of water molecules during transpiration. With reference to these arrows, name and define each process taking place.

arrow 1 .....

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arrow 2 .....

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arrow 3 .....

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[6]

(b) Leaves from different plant species transpire at different rates in the same environmental conditions.
Suggest and explain structural differences in the lower surface of these leaves which might produce differences in the transpiration rate.

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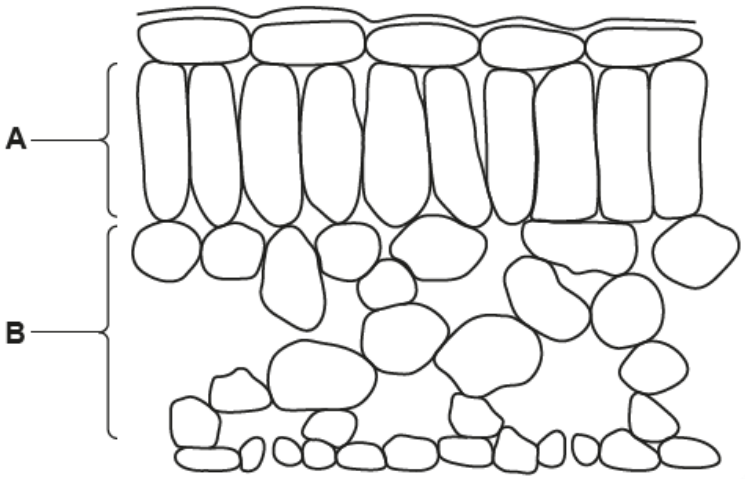
9. Nov/2022/Paper_22/No.2(a)

The diagram shows a cross-section through a leaf when viewed using a light microscope.



(a) (i) State the term used to describe a group of cells, such as those in part **A** or part **B** of the leaf cross-section.

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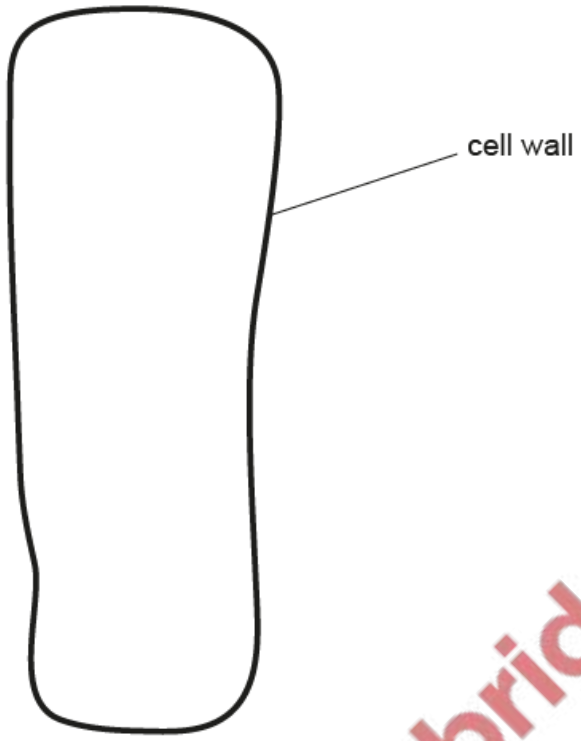
(ii) The diagram shows an enlargement of one cell from part **A** of the leaf cross-section.



Complete the diagram of the cell by drawing and labelling to show the position of

- **one** chloroplast
- **three** other types of **named** cell component that will be visible.

[4]

(iii) Use a label line on the diagram of the cross-section through a leaf to name and label **one** cell in the lower epidermis that would also contain chloroplasts. [1]

10. Nov/2022/Paper_22/No.8(a, b)

(a) Describe and explain the gas exchange that takes place between the leaf of a plant and the air in the atmosphere during a 24-hour period.

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(b) Outline the movement of water through a leaf during the process of transpiration.

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[Total: 10]